

MULTIMEDIA



UNIVERSITY

STUDENT ID

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MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 2, 2016/2017

TIS1101 – DATABASE FUNDAMENTALS

(All sections / Groups)

11 MARCH 2017
2.30 p.m - 4.30 p.m
(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This question paper consists of 6 pages, including the cover page, with FOUR questions only.
2. Attempt **ALL** questions. All questions carry equal marks and the distribution of the marks for each question is given.
3. Please write all your answers in the answer booklet provided.

Answer ALL Questions**QUESTION 1**

PrintIt is an online printing solution company. It enables its registered customer to order printing services through its Web site and courier the print works to the customer once done. Answer questions (a) and (b) based on the following business rules:

- *PrintIt* can print items such as bookmark, calendar, photos, books and poster. Every item is identified using a unique Item ID, size, printing materials and unit price.
- A customer must register for an account with *PrintIt* before placing any order. A customer can make many orders.
- Every order can contain more than one printing items, in specific quantity. Likewise, every item can be included in many orders. The total charge for every order can be calculated based on the unit price of item and the quantity respectively.
- For every order, customer may choose to pay via online bank transfer or credit card.
- *PrintIt* has engaged several courier service providers to deliver its orders. Every order will be sent to the customer via a specific courier service provider.
- Some courier service provider may be newly engaged and has not provided any courier service to *PrintIt* yet.

- (a) Based on the given business rules, draw an ER diagram (logical model) using Crow's Foot notation to represent the data requirements for *PrintIt*. The primary key and foreign key (if any) must be included for every entity, other attributes are optional. The cardinality, connectivity, relationship strength and participation of relationships in your ER diagram must be denoted accordingly.

[8 marks]

- (b) Assume that *PrintIt* has decided to give 5% discount to customers who have made accumulated order(s) of more than RM5000.00, and 10% discount with free gift (privilege) to those who have made accumulated order(s) of more than RM1000.00. These categories of customers are referred as Gold and Platinum customers respectively. Draw an ER diagram to depict the supertype and subtype relationship between regular customer, and Gold and Platinum customer.

[2 marks]

Continued

QUESTION 2

Answer questions (a) to (c) based on the following relational schema. The primary key for each relation is in bold and the foreign key is in *italic*.

PUBLISHER (**Publisher_Code**, Name, Address, Contact)

GENRE (**Genre_Category**, Description)

BOOK (**ISBN**, Title, Page_Number, Publication_Year, *Publisher_Code*, *Genre_Category*)

AUTHOR (**Author_ID**, Author_FName, Author_LName, Gender)

BOOK_AUTHOR (*ISBN*, *Author_ID*)

- (a) Assume that BOOK and AUTHOR tables have been created, write the SQL statement to create BOOK_AUTHOR table. Create the attributes for the table with relevant data types.

[2 marks]

- (b) The table below show sample records in BOOK and GENRE tables. Answer questions (b)(i) to (b)(iii) based on the following tables:

BOOK

ISBN	Title	Page_Number	Publication_Year	Publisher_Code	Genre_Category
123-0-12-374	Rainbow Mountain	200	2011	P2001	C200
898-2-96-545	Data Mining for Dummies	340	2012	P2002	C100
718-8-16-555	Asian Food	280	2013	P3002	C300
674-9-90-345	Yoga for the Mind	180	2016	P2002	C400
900-0-88-767	Finding Rainbow	250	2016	P2001	C200
888-9-55-447	Pastry Heaven	200	2016	P3002	C300

GENRE

Genre_Category	Description
C100	Information Technology
C200	Novel
C300	Cookery
C400	Lifestyle

Continued

- (i) Write a SQL statement to find the information of book(s) that has the word 'for' in the title(s).

[1 mark]

- (ii) Write the SQL statement to produce the following table as the result:

Publisher_Code	Description	Number_of_Books
P2001	Novel	2
P2002	Information Technology	1
P2002	Lifestyle	1
P3002	Cookery	2

[2 marks]

- (iii) Write the SQL statement to produce the following table as the result:

Description	Number_of_Books
Novel	2
Cookery	2

[2 marks]

- (c) Write a SQL statement to create a view named 'Book_2017' to list the book title, publisher's name and genre description of books which were published in 2017.

[3 marks]

Continued

QUESTION 3

Answer questions (a) – (b) based on the following table:

ArtistID	ArtistName	SongID	SongName	SongLength	SongGenre	SongReleasedDate	AlbumName
A1	John	S1	Wonder	3:27	R&B	5th May 2015	Fusion
A2	Shawn	S2	Remember	4:55	Soul	23rd Oct 2015	Mission
A2	Shawn	S3	Go	4:32	Pop	20th Nov 2015	Stellar
A2	Shawn	S2	Remember	4:55	Soul	23rd Oct 2015	Stellar
A3	Meghan	S1	Happy	3:27	R&B	5th May 2015	Ello

- (a) Draw the dependency diagram in 1NF for the above table, showing all dependencies. Underline the primary key.

[3 marks]

- (b) Based on your solution in Question 3(a), normalize the dependency diagram to 2NF. Underline the primary key.

[3 marks]

- (c) The following table has multivalued dependencies:

StudentID	Name	Club	Society
S100	Selva	Red Cross	IT Society
S100	Selva		Math Honor Society
S101	Elly	Lion's Club	History Society
S101	Elly	Chess Club	
S101	Elly	Swimming Club	
S102	Arthur	Red Cross	
S102	Arthur	Chess Club	
S103	Mahmod		IT Society

Normalize the above table to 4NF. Draw the resulting ERD in 4NF. Please make sure that you include the primary/foreign key(s), attributes, relationships and connectivities.

[4 marks]

Continued

QUESTION 4

- (a) One of the characteristics of Internet technologies is *hardware and software independence*. List TWO benefits of hardware and software independence. [2 marks]
- (b) What is the main purpose of identifying the scope and boundary during database initial study? [2 marks]
- (c) Describe any THREE characteristics of the data held in a data warehouse. [3 marks]
- (d) List any THREE disadvantages of Cloud computing. [3 marks]

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